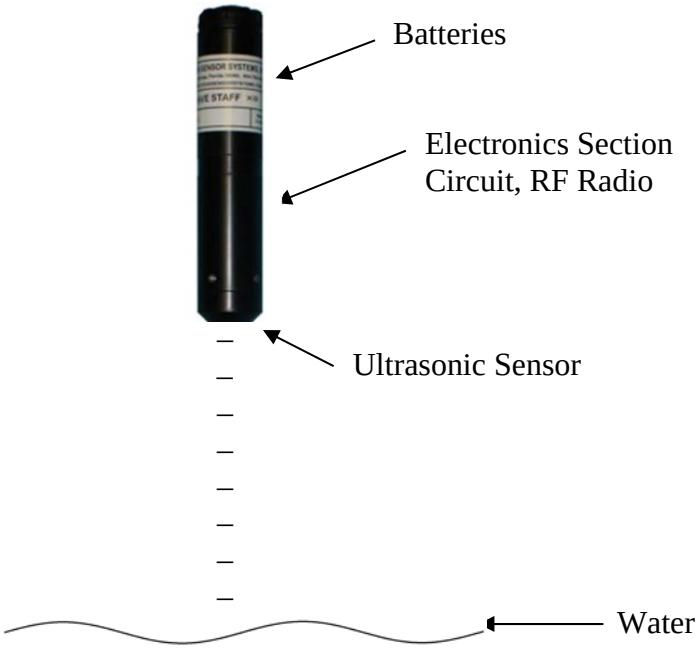
OSSI-010-035 Sonic Wave Sensor XB
User Manual

Introduction: The Ocean Sensor Systems wireless Sonic Wave Sensor XB has been designed to provide a high-resolution measurement of Intracoastal and wave tank waves. Waves can be measured from sub-millimeter to several hundred centimeters at a data rate up to 32 Hz. Other applications include the measurement of tides, ponds, tanks and pool levels. The instrument is capable of operating for months on two standard C cell alkaline batteries. It can collect data continuously or in a burst sampling mode; sampling for short periods and then going into low power sleep mode. The Sonic Wave Sensor XB is very robust with solid-state electronics sealed in a waterproof housing.

Laptops and PCs can easily receive data with our optional wireless USB Adaptors. Time stamped data can be used to synchronize up to 8 Sonic Wave Sensor XBs for wave directional measurements.

Please see the data sheet available on our web site at www.oceansensorsystems.com for detailed information.

Sonic Wave Sensor



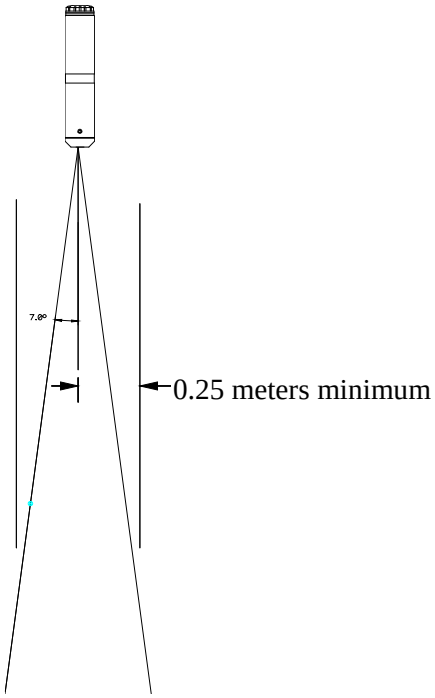
This manual is designed to help the user with the installation and maintenance of the Sonic Wave Sensor XB. We at Ocean Sensor Systems are dedicated to making your use of our equipment as easy and rewarding as possible.

Operating principle: The basic operating principle is to measure the ultra sound travel time. The result is then scaled with a Micro Processer, in the unit, and then it is transmitted over the Xbee's wireless network to an Xbee USB adapter. A Windows USB to Serial Converter (driver) connects the USB Adapter port to the User Interface Software (GUI).

Mounting: The physical mounting of the Main Unit at the measurement site requires no special protection from spray, rain or sun. The unit should be mounted with the Sensor projecting down to the water. The water surface for the highest and lowest tide plus waves should be considered when mounting the unit. The output is a measurement of the distance from the unit to the water.

The unit may be mounted with clamps around the body of the black electronics housing. Specially designed Mounting Hardware is available from OSSI for this purpose (see OSSI 015-018-B Mounting Bracket).

When mounting the Sonic Wave Sensor XB, a level should be used to assure it is vertical. The unit should be mounted such that the ultrasonic air space is least 0.25 meters away from any objects. However a flat vertical surface may be closer in some cases. The unit should stay at least 0.2 meters above the water.



Power Requirements:
The power is provided with 2 C size batteries. The battery type may be Alkaline or nickel–metal hydride**.** The voltage sum of the two batteries must be greater than 1.8 volts for the unit to operate. The voltage sum must never exceed 3.3Volts.

Batteries ALKALINE C 1.5V Energizer # EN93 Part number OSSI-591-014

Batteries NIMH C 1.2V Energizer #NH35BP-2 Part number OSSI-591-015

To add or change batteries unscrew the battery holder cap on the top of the Electronics Section. Note: Use a small piece of tape to link the batteries together to extract the batteries while the Electronics Section is in a vertical position.

Wireless Computer Adapter:
The Wave Sensor XB wireless network protocol is called Xbee. A connection from the Xbee Wireless network to a computer can be made with either an Xbee to USB Adapter or an Xbee to Serial Adapter. The following are the three types that are available:

The XStick USB Adapter XU-Z11 part #OSSI-581-016 for US,CA,EU with a RF Line of Sight Range of 66 ft. and Indoor/Urban Range of 200 ft.

XBee ZB USB Adapter XA-Z14-CE1P part #OSSI-581-019-A Pro for North America with a RF Line of Sight Range of 2 miles and Indoor/Urban Range of 300 ft. and OSSI-581-019-W Pro for International with a RF Line of Sight Range of 4000 ft. and Indoor/Urban Range of 200 ft.

XBee RS232 Adapter XA-Z14-CS2PH part #OSSI-581-020-A Pro for North America with a RF Line of Sight Range of 2 miles and Indoor/Urban Range of 300 ft. and OSSI-581-020-W Pro for International with a RF Line of Sight Range of 4000 ft. and Indoor/Urban Range of 200 ft.

Maintenance: The Ocean Sensor Systems Sonic Wave Sensor XB requires minimal maintenance. Prolonged exposure to the environment may require cleaning the outside of the unit. Use only soap, water and a soft cloth.